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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,113	02/20/2004	Qun Feng Liao	372465-01801	5256

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EXAMINER	
BRAUTIGAM, ALYSA N	
ART UNIT	**PAPER NUMBER**
2676	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/784,113	LIAO ET AL.	
	Examiner	Art Unit	
	Alysa N. Brautigam	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-9* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 5 contains several logical blocks which are not adequately discussed in the specification. In particular, all the blocks following the "Mip-mapping?" decision point require either amplification, clarification, or correction in the discussions provided in paragraphs 00013-00017. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

Paragraph 00019, line 3 – "...bit 4 **is** indicates..."

Appropriate correction is required.

Claim Objections

3. Claims 4, 5, 7, and 8 are objected to because of the following informalities: These claims all reference "the continuity adjustment" of claim 2; however, claim 2 discloses a "continuity adjustment code" (line 3) and "an adjustment" (line 6). For the purpose of further review, it will be assumed the "continuity adjustment" referenced in claims 4, 5, 7, and 8 is the "adjustment" of claim 2, line 6. It is recommended the language of claim 2 be amended such that line 6 discloses a "continuity adjustment." Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over NVIDIA ("OpenGL Cube Map Texturing") in view of Iourcha (6,373,496).

6. In regards to claim 1, NVIDIA discloses a method of performing cubic mapping with texturing, comprising:

- selecting neighboring pixels to be mapped (page 13, Setting the Images);
- computing normals of the neighboring pixels (page 14, Texture Coordinate Generation Modes);
- mapping the normals of the pixels to faces of a cube (pages 13-14), wherein the neighboring pixels are such as to be mapped to adjacent faces of the cube (pages 13, Setting the Images), and each face has an identifying number (page 14 where the identifying number is major axis direction), a level of detail (LOD) number (page 16, Example Source Code discloses the EXT_texture_lod_bias), and a pair of texture coordinates for defining a mip-map for the face (pages 13-14, Setting the Images and Mapping Texture Coordinates);

While NVIDIA discloses the calculation of LOD parameters as an inherent part of mip-mapping (page 14, Mapping Texture Coordinates), NVIDIA does not specifically disclose wherein computing an LOD parameter for the texture coordinates of the neighboring pixels is based on continuity-adjusted derivatives of the texture coordinates. Iourcha discloses an apparatus and method for texture mapping using mip-maps wherein computing an LOD parameter for the texture coordinates of the neighboring pixels is based on continuity-adjusted derivatives of the texture coordinates (col. 1: 60 through col. 2: 65). It would have been obvious to one skilled in the art to which it pertains at the time the invention was made to integrate the teachings of NVIDIA and

Iourcha to achieve a system and method wherein texturing is utilized via mip-maps and levels of detail such that the LOD parameter for the texture coordinates of the neighboring pixels is based on continuity-adjusted derivatives of the texture coordinates in order to efficiently assign texture values to a warped image.

7. In regards to claim 2, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 1. In addition, the combination discloses wherein the step of computing an LOD parameter includes:

- obtaining a continuity adjustment code based on the identifying numbers for each of the adjacent faces (col. 3: 15-21);
- using the adjustment code to compute an approximation to derivatives of the texture coordinates, the approximation including an adjustment to maintain continuity of the derivatives across the adjacent faces (col. 3: 22-37); and
- computing the LOD parameter based on the continuity-adjusted derivatives (col. 3: 38-42 and col. 2: 37-65).

It would have been obvious to one skilled in the art to which it pertains at the time the invention was made to integrate the teachings of NVIDIA and Iourcha to achieve a system and method wherein texturing is utilized via mip-maps and levels of detail such that the LOD parameter for the texture coordinates of the neighboring pixels is based on continuity-adjusted derivatives of the texture coordinates in order to efficiently assign texture values to a warped image.

8. In regards to claim 3, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 2. In addition, NVIDIA discloses

wherein the continuity adjustment code is obtained from a table of codes, the table being indexed by the identifying numbers for the faces (NVIDIA: page 14 where the identifying number is major axis direction).

9. In regards to claim 5, the combination of NVIDIA and Iourcha a method of performing cubic mapping as recited in claim 4. In addition, NVIDIA discloses the method further comprising the step of normalizing the texture coordinates prior to computing the LOD parameter (NVIDIA: page 14, Texture Coordinate Generation Modes); and wherein the continuity adjustment includes compensating for the normalizing step (NVIDIA: page 14, paragraphs 2-5).

10. In regards to claim 6, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 5. In addition, NVIDIA discloses wherein the step of compensating includes adding or subtracting one (NVIDIA: page 14, paragraphs 2-5).

11. In regards to claim 7, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 2. In addition, the combination discloses wherein the approximation to the derivative of the texture coordinates is based on the difference between the texture coordinates of the neighboring pixels (col. 2: 37-65); and wherein the continuity adjustment includes negating one of the texture coordinates (col. 3: 38-42 and col. 2: 37-65 discloses where the greater of the two is chosen which is equivalent to negating the other). It would have been obvious to one skilled in the art to which it pertains at the time the invention was made to integrate the teachings of NVIDIA and Iourcha to achieve a system and method wherein texturing is

utilized via mip-maps and levels of detail such that the LOD parameter for the texture coordinates of the neighboring pixels is based on continuity-adjusted derivatives of the texture coordinates in order to efficiently assign texture values to a warped image.

12. In regards to claim 8, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 7, further comprising the step of normalizing the texture coordinates prior to computing the LOD parameter (NVIDIA: page 14, Texture Coordinate Generation Modes); and wherein the continuity adjustment includes compensating for the normalizing step (NVIDIA: page 14, paragraphs 2-5).

13. In regards to claim 9, the combination of NVIDIA and Iourcha discloses a method of performing cubic mapping as recited in claim 8, wherein the step of compensating includes adding or subtracting one (NVIDIA: page 14, paragraphs 2-5).

Allowable Subject Matter

14. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 4 recites the limitation, "wherein the continuity adjustment includes swapping coordinates in a pair of texture coordinates," where prior art, either alone or in combination, does not teach or suggest wherein an adjustment is made across adjacent faces and the adjustment includes swapping coordinates in a pair of texture coordinates.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schilling et al. (6,236,405) discloses a system and method for mapping textures onto surfaces of computer generated objects. Wloka et al. (6,765,584) discloses a system and method for creating a vector map in a hardware graphics pipeline.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alysa N. Brautigam whose telephone number is 571-272-7780. The examiner can normally be reached on 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

anb

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